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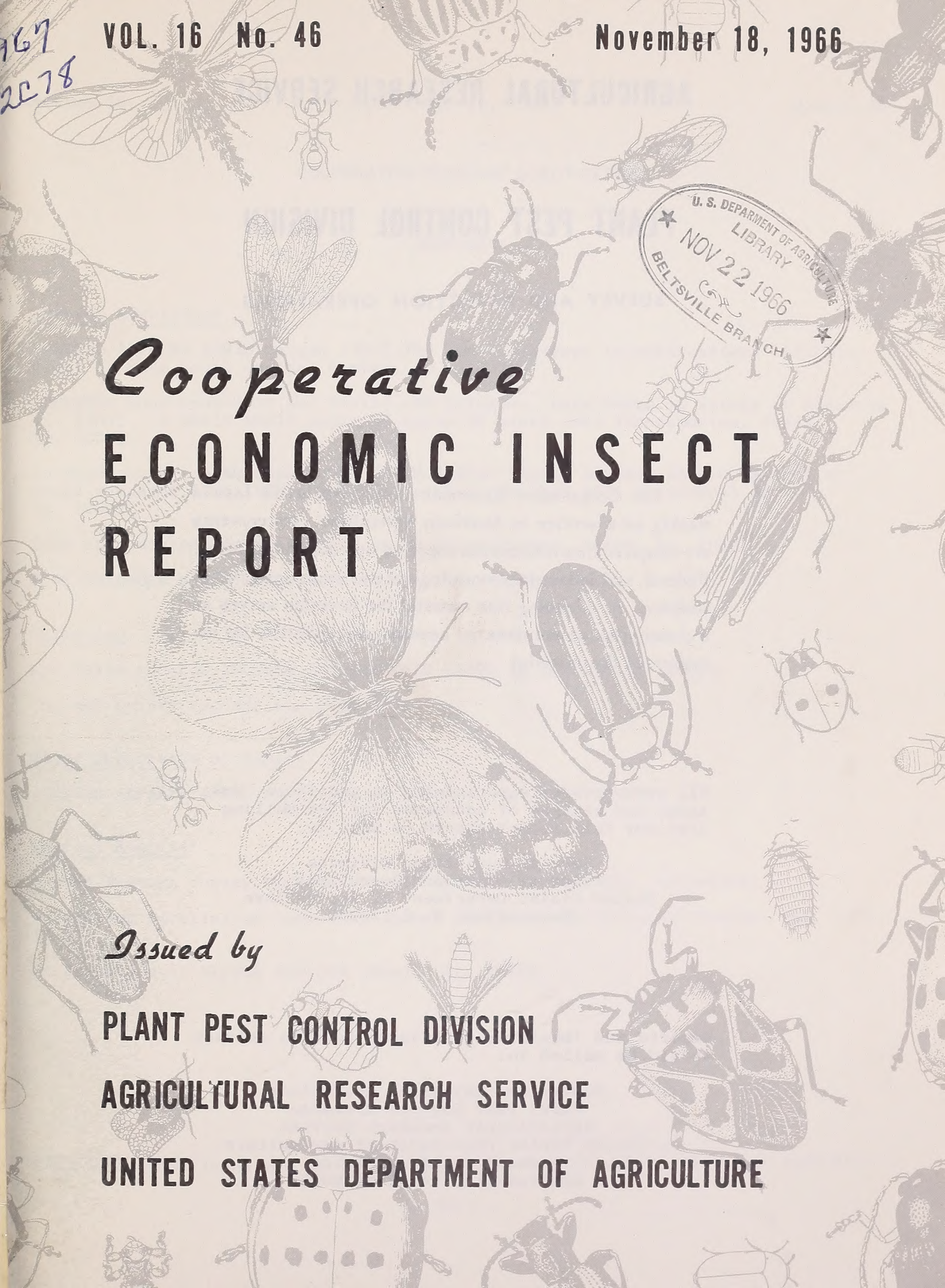

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 16 November 18, 1966 Number 46

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

SPOTTED ALFALFA APHID ranged 100-2,700 per 100 sweeps in southeastern Illinois. Light in four south central States. (p. 1063).

GREENBUG noneconomic in New Mexico and Oklahoma; none found in Kansas or Arkansas. (p. 1063). A GRAIN APHID heavy on roots of wheat near Throckmorton, Texas. (p. 1064).

Average number of EUROPEAN CORN BORER larvae higher in Indiana and central Nebraska compared with 1965; caused 10 percent dropped ears in central Iowa. (p. 1063).

HORN FLY heaviest in many years in Crockett County, Texas. (p. 1066).

PINK BOLLWORM situation in California. (p. 1067).

Detection

New State records include two BRACONID WASPS in Hawaii. (p. 1069).

For new county records see page 1068.

First Occurrence of Season

SPOTTED ALFALFA APHID appearing in Arizona. (p. 1063).

Special Reports

Spruce Budworm Survey Methods in the Northern Region. (pp. 1071-1072).

Estimating Defoliation Caused by Spruce Budworm from Undamaged Shoots. (pp. 1073-1074).

Distribution of MIMOSA WEBWORM (Map). (p. 1075).

Reports in this issue are for week ending November 11 unless otherwise indicated.

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WEATHER BUREAU'S 30-DAY OUTLOOK

MID-NOVEMBER TO MID-DECEMBER 1966

Weather Bureau's 30-day outlook for mid-November through mid-December calls for temperatures to average above seasonal normals from the central and southern Plateau eastward through the central and southern Plains to the Appalachians. Below normal temperatures should be confined to the Northeast and the Northwest while near normal values are expected in unspecified areas. Precipitation is expected to exceed normal over the western quarter of the Nation and in parts of the southern Plains. Subnormal totals are indicated for most areas east of the Mississippi as well as eastern portions of the northern and central Plains. In unspecified areas near normal precipitation is in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

Weather continued on page 1076.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMYWORM (*Pseudaletia unipuncta*) - TEXAS - This and fall armyworm activity continues decline as expected with no economic infestations noted. (Texas Coop. Rpt.).

CORN EARWORM (*Heliothis zea*) - IOWA - Infestation caused less than 1 percent loss in east central, west central and southeast areas this season. (Iowa Ins. Inf.).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - MISSISSIPPI - Adults and nymphs moderate, 10 per square foot on alfalfa in Pontotoc County. (Dinkins). ARKANSAS - Ranged 100-200 per 100 sweeps in Washington County alfalfa. (Boyer). OKLAHOMA - Ranged 72-82 per 10 sweeps in alfalfa in Sequoyah and Le Flore Counties. (Okla. Coop. Sur.). ARIZONA - Light and scattered on alfalfa in Gila Valley, Yuma County. This first indication of fall infestations in area. (Ariz. Coop. Sur.). KANSAS - Very light, 0-5 per 10 sweeps, in alfalfa in north central, northwest, central and south central districts week ending November 4. (Simpson, Redding). Currently 0-5 per 10 sweeps in alfalfa in southwest and south central districts. (Simpson). ILLINOIS - Ranged 100-2,700 per 100 sweeps in southeast district. (White).

GREENBUG (*Schizaphis graminum*) - NEW MEXICO - Very light on wheat in Curry County. (Mathews). OKLAHOMA - Averaged 10 per linear foot on wheat in Le Flore County. Ranged 2-3 per linear foot in Cotton County. Averaged 2 per linear foot in oats in Haskell County. (Okla. Coop. Sur.). ARKANSAS - Survey negative in northwest area. (Boyer). KANSAS - No aphids found on wheat in southwest or south central districts. (Simpson).

CORN LEAF APHID (*Rhopalosiphum maidis*) - NEW MEXICO - Medium to heavy on fall barley in Dona Ana and Eddy Counties. (Campbell, Nielsen).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (*Ostrinia nubilalis*) - ALABAMA - Larvae caused light damage to corn in Blount and Chilton Counties. (Upton, Futral). KANSAS - Percent infestation 8 in field of corn in Crawford County, 36 in Bourbon County field. (Simpson, Nov. 4). Infestation 12 percent in Neosho County field, 28 percent in Woodson County field. (Redding). NEBRASKA - Fall survey shows infestation in east about equal to last year; in central part of State population much higher this year. Average number of borers per 100 stalks 233 in central area, 120 in east area. (Rhine). IOWA - Fall survey indicates large buildup of second brood. Averaged 10 percent dropped ears in central area. (Iowa Ins. Inf.). INDIANA - Number of borers per 100 plants averaged 44.3 in State compared with 37.5 last year. (Huber).

SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) - ALABAMA - Survey for eastward movement completed. No new counties found infested. (McQueen). TENNESSEE - Survey revealed infestations in Robertson, Cheatham, Davidson and Bedford Counties. All new county records. (Williams). MISSOURI - Average percent girdled stalks ranged 0.8-13.6 in 9 southwest counties and up to 36.0 in 10 southeast counties. (Munson). KANSAS - One borer found in 25 plants inspected in field of corn in Neosho County; 3 found in 25 plants in Woodson County. No other infested fields observed in these 2 counties. (Simpson). One field in Crawford County found with 20 percent infestation. No borers found in any other field checked in Wilson, Crawford or Bourbon Counties. (Simpson, Nov. 4).

CORN ROOTWORMS (*Diabrotica* spp.) - IOWA - Incidence highest in western area. Single *D. virgifera* adult taken in Allamakee County, September 15, 1966. New county record. Clayton County only county in State where western corn rootworm not reported. (Iowa Ins. Inf.).

CHINCH BUG (*Blissus leucopterus*) - IOWA - Ranged 100-200 per plant in field of corn near Farmington. (Iowa Ins. Inf.).

SMALL GRAINS

GRAIN APHIDS - ALABAMA - Heavy numbers damaging oats in Chambers County; considerable yellowing evident. (Farrar, Stewart). TEXAS - *Rhopalosiphum rufiabdominalis* heavy on wheat near Throckmorton, Throckmorton County; congregating on roots and around base of plants. Averaged 8-10 per plant. (Lindsey). OKLAHOMA - *R. padi* ranged 2-6 per linear foot on wheat in Cotton and Le Flore Counties and oats in Haskell County. *Macrosiphum avenae* averaged 12 per linear foot on oats in Haskell County. (Okla. Coop. Sur.).

HESSIAN FLY (*Mayetiola destructor*) - KANSAS - Up to 90 percent of plants infested in one Jewell County field and 100 percent in Norton County field, November 4. Wheat samples collected in south central and southwest districts indicate infestation absent in most fields; however, up to 50 percent of plants infested in Seward County field and 60 percent in one Hodgeman County field. (Simpson).

WINTER GRAIN MITE (*Penthaleus major*) - OKLAHOMA - Ranged 4-7 per linear foot in wheat in single Cotton County field; none noted in other fields checked. (Okla. Coop. Sur.).

TURF, PASTURES, RANGELAND

A SOD WEBWORM (*Crambus luteolellus*) - TEXAS - Larvae recently damaged many St. Augustine grass lawns throughout Corpus Christi area, Nueces County. (Garrett).

FIRE ANT (*Solenopsis geminata*) - TEXAS - Light infestations noted on rangeland near Goliad, Goliad County. Few mounds present, some 14-16 inches high. (Hajdik).

FORAGE LEGUMES

ALFALFA WEEVIL (*Hypera postica*) - MICHIGAN - Adults collected from alfalfa in Lenawee County November 1 and from Monroe and Hillsdale Counties November 1 and 9 respectively. Ranged 1-8 per 2,000 sweeps. Det. R. E. Warner and A. C. Dowdy. These new county records. (Hanna et al.). MARYLAND - Several adults collected inside home in Baltimore County. (U. Md., Ent. Dept.). MISSISSIPPI - Very light on alfalfa in Pontotoc County; 1 larva per square foot. No adults found. Damage negligible. (Dinkins). ARKANSAS - Survey negative in Washington County. (Boyer).

PEA APHID (*Acyrthosiphon pisum*) - NEW MEXICO - Light in alfalfa throughout State. (N. M. Coop. Rpt.). OKLAHOMA - Averaged 10 per 10 sweeps in alfalfa in Le Flore County. (Okla. Coop. Sur.). KANSAS - Populations light, 0-5 per 10 sweeps in north central, northwest, central and south central districts week ending November 4. Occasional alfalfa field with 5 per 10 sweeps in southwest and south central areas. None present in most fields checked. (Simpson). ARKANSAS - Very low in alfalfa and vetch in northwest area. (Boyer). MISSSISSIPPI - Very light, 1-2 per square foot, on alfalfa in Pontotoc and Oktibbeha Counties. (Dinkins). ILLINOIS - Range 140-3,300 per 100 sweeps in southeast district. (White).

SWEET CLOVER APHID (*Therioaphis riehmi*) - UTAH - Severe on Hubam clover in experimental greenhouse at Logan, Cache County. (Knowlton, Nielsen).

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) - MISSISSIPPI - Light on alfalfa in Pontotoc County; damage light. (Dinkins). ARIZONA - Observed on alfalfa in Yuma, Maricopa and Pinal Counties. (Ariz. Coop. Sur.).

TARNISHED PLANT BUG (*Lygus lineolaris*) - OKLAHOMA - Ranged 7-10 per 10 sweeps in alfalfa in Sequoyah and Le Flore Counties. (Okla. Coop. Sur.).

COTTON

BOLL WEEVIL (Anthonomus grandis) - ALABAMA - Survey in Marshall County cotton revealed 16 live and 11 dead adults in fields following 23 degree temperatures. Few pupae in bolls still alive. (Murphy et al.).

For Boll Weevil complex in Arizona see page 1067.

SUGARBEETS

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - Few moderate infestations continue to require controls in Maricopa County sugarbeets. (Ariz. Coop. Sur.).

SALT-MARSH CATERPILLAR (Estigmene acrea) - ARIZONA - Protection of seedling sugarbeets necessary in many areas of Maricopa County. (Ariz. Coop. Sur.).

GENERAL VEGETABLES

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Heavy populations continue serious to vegetable growers in Yuma, Maricopa, Pima and Pinal Counties. (Ariz. Coop. Sur.).

DESERT CORN FLEA BEETLE (Chaetocnema ectypa) - ARIZONA - Moderate to heavy numbers caused light to moderate damage to lettuce and sugarbeets in areas of Maricopa County. (Ariz. Coop. Sur.).

MELON APHID (Aphis gossypii) - ARIZONA - Light to moderate adult flights moving into lettuce fields in Maricopa and Yuma Counties. (Ariz. Coop. Sur.).

DECIDUOUS FRUITS AND NUTS

WHITE PEACH SCALE (Pseudaulacaspis pentagona) - FLORIDA - Feeding on new growth of peach; 45 percent of adult females still living, 50 percent have unhatched eggs. Of females attached to bark on trunks, only 23 percent still living; eggs under 85 percent of females, hatched. Crawlers very abundant, some settling down on unsprayed observation trees at Gainesville, Alachua County. (Kuitert, Nov. 9).

ORNAMENTALS

TWIG GIRDLER (Oncideres cingulata) - TEXAS - Large population girdling twigs and branches of pecans, roses, honeylocust, and several other shade trees in Austin, Travis County. (Schumann).

A PYRAUSTID MOTH (Undulambia polystichalis) - FLORIDA - Larvae and pupae moderate on stems of holly fern at rate of 1 plant per square foot in fernery at Orange City, Volusia County. (Roberts, Nov. 1).

AZALEA LEAF MINER (Gracillaria azaleella) - CALIFORNIA - Locally heavy on azalea nursery stock at Lodi, San Joaquin County. (Cal. Coop. Rpt.).

AN APHID (Cinara tujafilina) - NEW MEXICO - Medium to heavy on arborvitae around Los Lunas, Valencia County, and Albuquerque, Bernalillo County. (Heninger).

ARMORED SCALES - OKLAHOMA - Fifth-generation Unaspis euonymi crawlers active in Payne County. Numbers much lower than earlier generations; ranged 5-10 per leaf. (Okla. Coop. Sur.). FLORIDA - All stages of Ischnaspis longirostris moderate on leaves of 80 percent of 30 yellow palms at nursery in Tampa, Hillsborough County. (Hale, Nov. 3). Adults of Pseudaonidia clavigera light on stems of 22 percent of 2,600 camellia plants at nursery in Tampa, Hillsborough County. (Hale, McFarlin, Nov. 7).

MEALYBUGS - CALIFORNIA - *Pseudococcus obscurus* medium on azalea nursery stock at Sacramento, Sacramento County. Heavy populations of *Trionymus diminutus* infesting New Zealand flax nursery stock in Redwood City, San Mateo County. (Cal. Coop. Rpt.).

FOREST AND SHADE TREES

SOUTHERN PINE BEETLE (*Dendroctonus frontalis*) - Epidemic populations on Federal land continue on Francis Marion National Forest in SOUTH CAROLINA, on Homochitto National Forest in MISSISSIPPI, and on Big Thicket and Angelina Districts in TEXAS. On private land, epidemic populations continue in ALABAMA, LOUISIANA, MISSISSIPPI, NORTH CAROLINA and VIRGINIA. (South. For. Pest Rptr., Oct.).

ENGRAVER BEETLES (*Ips* spp.) - Populations increased to near epidemic proportions in ARKANSAS and NORTH CAROLINA, probably due to insufficient rainfall. (South. For. Pest Rptr., Oct.).

BRONZE BIRCH BORER (*Agrilus anxius*) - MINNESOTA - Survey in nursery blocks indicates 33 percent of birch trees infested. Infested trees condemned and will be destroyed. (Minn. Ins. Rpt.).

TWIG GIRDLER (*Oncideres cingulata*) - TEXAS - Moderate populations cited on pecan and oak trees throughout New Braunfels, Comal County. (Schumann).

FALL CANKERWORM (*Alsophila pometaria*) - INDIANA - Emerged November 7 in Warren and Tippecanoe Counties. Emergence earlier than in past few years; male activity considerably greater. (Chandler).

OBSCURE SCALE (*Melanaspis obscura*) - MARYLAND - Heavy on oaks in Silver Spring, Montgomery County. (U. Md., Ent. Dept.).

DOGWOOD CLUB-GALL MIDGE (*Mycodiplosis alternata*) - ALABAMA - Galls light to medium on native dogwood throughout State. Some larvae emerged. (McQueen).

MAN AND ANIMALS

MOSQUITOES - LOUISIANA - Larval collections in Jefferson Parish contained *Anopheles quadrimaculatus*, *Culex pipiens quinquefasciatus*, and *Culiseta inornata*. Light trap collections decreased due to cooler, windy weather; *Culex salinarius* dominant. *Aedes sollicitans* counts high in Grand Isle area. (Stokes). TEXAS - Jefferson County collections for 1966 remain considerably above 1965 with exception of the Port Arthur trap. *Culex salinarius* appears on increase, *C. pipiens quinquefasciatus* remains plentiful. *Anopheles crucians* increased throughout county, particularly in northern section. *Mansonia perturbans* continues to appear in small numbers in Port Arthur trap. *Uranotaenia* spp. very common throughout area. (Thompson).

HOUSE FLY (*Musca domestica*) - ARKANSAS - Cold weather greatly reduced activity. Few flies seen in poultry houses. Reproduction believed ceased. (Simco).

HORN FLY (*Haematobia irritans*) - OKLAHOMA - Averaged less than 10 per head on cattle in Noble and Payne Counties. (Okla. Coop. Sur.). TEXAS - Widespread populations heaviest in many years in Crockett County this fall on cattle and sheep. (Jacoby).

SCREW-WORM (*Cochliomyia hominivorax*) - Total of 69 cases reported in U. S. November 6-12 as follows: TEXAS - Presidio 7, Dimmit 3, Jeff Davis 1, Webb 4, Val Verde 1, Llano 3, Frio 1, Bell 3, Mills 1, San Saba 1, Kinney 1, McCulloch 2, Maverick 2, Brewster 1, Blanco 1, Duval 1, Sutton 1, Hays 1, La Salle 1, Reeves 1. ARIZONA - Mohave 2, Yavapai 1, Yuma 4, Maricopa 11, Pinal 8. NEW MEXICO - Eddy 1. CALIFORNIA - Riverside 3, Imperial 2. Total of 312 cases reported in portion of Barrier Zone in Republic of Mexico as follows: Baja California Sur 60, Sonora 121, Chihuahua 55, Coahuila 37, Nuevo Leon 18, Tamaulipas 21. Total of 295 cases reported from Mexico south of Barrier Zone. Barrier Zone is area where eradication operations underway to prevent establishment of self-sustaining population in U. S. Sterile screw-worm flies released: Texas 60,912,260, Arizona 10,900,000, New Mexico 1,080,000, California 1,716,000, Mexico 47,640,000. (Anim. Health Div.).

WINTER TICK (Dermacentor albipictus) - OKLAHOMA - Ranged 200-300 per head on deer checked in Pittsburg County. None observed on cattle in area. (Okla. Coop. Sur.).

HOUSEHOLDS AND STRUCTURES

CLOVER MITE (Bryobia praetiosa) - MARYLAND - Very heavy in homes in Carroll and Prince Georges Counties. (U. Md., Ent. Dept.). PENNSYLVANIA - Very abundant and annoying at new development in State College, Centre County. (Gesell, Menusan).

STORED PRODUCTS

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) - PENNSYLVANIA - Collected at school cafeteria in Bradford, McKean County. (Gesell, Sept. 31). ALABAMA - This species, rice weevil and square-necked grain beetle infesting much of corn in Lee County still in field. (Teague).

FEDERAL & STATE PLANT PROTECTION PROGRAMS

PINK BOLLWORM (Pectinophora gossypiella) - CALIFORNIA - Survey in San Joaquin Valley continues with 250 additional traps. Collections continue in desert areas, adjacent to Arizona. Status of collections this season: Imperial County - Bard Valley 976 adults, 925 larvae, 2 pupae, 756 acres treated; Imperial Valley 1,106 adults, 409 larvae, 1 pupa, 91,126 acres treated. Riverside County - Palo Verde Valley 2,807 adults, 6,846 larvae, 10 pupae; Coachella Valley 68 adults, 9 larvae, 12,848 acres treated. San Diego County - Borrego Valley 24 adults, 900 acres treated. San Bernardino County - Needles 145 adults, 9 larvae; Sandy Valley 1 adult. Los Angeles County - Lancaster 5 adults. Kern County - Cantil 2 adults. Frosts in Antelope Valley, Cantil and Lancaster areas eliminated growing cotton. (Cal. Coop. Rpt.). NEW MEXICO - Boll checks in Eddy County reveal mortality rate of 10-20 percent of larvae left in cotton fields. (Nielsen, Campbell). OKLAHOMA - Taken in lint cleaner surveys in Custer, Washita and Kiowa Counties. (Okla. Coop. Sur.).

BOLL WEEVIL COMPLEX (Anthonomus grandis complex) - ARIZONA - Increased populations found in cotton in Stanfield area of western Pinal County. (Ariz. Coop. Sur.).

WHITE-FRINGED BEETLES (Graphognathus spp.) - ARKANSAS - Eight properties involving 100 acres found infested in northwest area of West Memphis, Crittenden County. (Frazier).

MEXICAN FRUIT FLY (Anastrepha ludens) - CALIFORNIA - No unmarked native flies trapped for some time. In area along Mexican border in San Diego County, fly catches dropped materially with advent of cooler weather and rain. (Cal. Coop. Rpt.).

CARIBBEAN FRUIT FLY (Anastrepha suspensa) - FLORIDA - Larvae taken from navel orange at Belle Glade, Palm Beach County. (Simanton, Starling, Nov. 7).

CITRUS WHITEFLY (Dialeurodes citri) - CALIFORNIA - In San Diego, San Diego County, more than 150 city blocks now infested. Treatment anticipated in 300 city blocks. In Sacramento, Sacramento County, approximately 700 city blocks will receive treatment and in Fresno, Fresno County, about 200 city blocks. No live whiteflies taken in Fresno area this summer. (Cal. Coop. Rpt.).

WESTERN GRAPE LEAF SKELETONIZER (Harrisina brillians) - CALIFORNIA - Survey negative in previously infested areas in Kings, Yolo and Sacramento Counties. (Cal. Coop. Rpt.).

INSECT DETECTION

New State Records

A BRACONID WASP (Meteorus n. sp.) - HAWAII - Reared from LIGHT-BROWN APPLE MOTH (Epiphyas postvittana) at Olinda, Maui, in October 1964 and July 1966. Det. by R. D. Eady. (p. 1069).

A BRACONID WASP (Doryctes parvus) - HAWAII - Collected from kiawe (Prosopis pallida) twigs infested with bark beetles in February 1966 at Honouliuli, Oahu. Det. by C. F. W. Muesebeck. (p. 1069).

New County Records

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - TENNESSEE - Collected in Robertson, Cheatham, Davidson and Bedford Counties. (p. 1063).

WESTERN CORN ROOTWORM (Diabrotica virgifera) - IOWA - Adult collected September 15, 1966, in Allamakee County. (p. 1063).

ALFALFA WEEVIL (Hypera postica) - MICHIGAN - Collected November 1, 1966, in Lenawee and Monroe Counties and November 9, 1966, in Hillsdale County. Det. by R. E. Warner and A. C. Dowdy. (p. 1064).

CORRECTIONS

CEIR 16(28):677 - Citrus Insect Situation in Florida - End of June - CITRUS RUST MITE (Phyllocoptrura oleivora)...All districts will have 10-30 percent...

CEIR 16(34):840 - Line 3 should read: "...Highest district east. BLACK SCALE (Saissetia oleae) infested 69 percent of groves; 55 percent economic. Population decreased greatly..."

CEIR 16(44):1035, 1036 - LEEK MOTH (Acrolepis assectella) - Should read: LEEK MOTH (Acrolepia assectella) - HAWAII - Collected in green onions on Maui. (p. 1036).

HAWAII INSECT REPORT

New State of Hawaii Insect Records - Several adults of a parasitic BRACONID WASP (*Meteorus* n. sp., near *ictericus*) reared from LIGHT-BROWN APPLE MOTH (*Epiphyas postvittana*) at Olinda, Maui, in October 1964 and July 1966. Det. by R. D. Eady. (Chong). One adult of a parasitic BRACONID WASP (*Doryctes parvus*) collected from kiawe (*Prosopis pallida*) twigs infested with bark beetles in February 1966. Twigs collected from Honouliuli, Oahu. Det. by C. F. W. Muesebeck. (Chong).

Insects of Regional Significance - Adult survey conducted over 15 square miles in Waiohinu, Hawaii Island, at 950-2,000 feet elevation. Counts per trap day averaged 964 *Dacus dorsalis*, 9 *D. cucurbitae* and 0.009 *Ceratitis capitata*; 40 traps used for each species, 0.2 miles apart. (Hawaii Fruit Fly Investigations). Adults of a PLATASPID BUG (*Coptosoma xanthogramma*) light on peduncles and twigs of fruiting and flowering acerola (*Malpighia punicifolia*) in Lanikai, Oahu. May have caused some premature fruit drop. (Davis). SOUTHERN GREEN STINK BUG (*Nezara viridula*) nymphs and adults increasing but remain light on wild weed hosts in Kahului, Maui; 67 percent of adults bore eggs of a TACHINA FLY (*Trichopoda pennipes*). (Miyahira).

General Vegetables - IMPORTED CABBAGEWORM (*Pieris rapae*) adults medium to heavy in cabbage plantings in Omaopio, Maui. (Miyahira).

Ornamentals - FULLER ROSE BEETLE (*Pantomorus cervinus*) adults abundant on weeping willow in Waimea, Hawaii Island. Foliar damage evident. (Yoshioka).

Miscellaneous Pests - Continuous rainfall caused heavy activity of GIANT AFRICAN SNAIL (*Achatina fulica*) in generally dry Koko Head area of Oahu. Movements from bordering thickets to residential areas evident. (Nakao).

Beneficial Insects - Adults of a BRACONID WASP (*Meterous laphygmae*) reared from *Selca brunella* (an arctiid moth) in March 1966. Larvae collected from Kulani, Hawaii Island. This new host record for *M. laphygmae*. Some other hosts include armyworm, corn earworm, beet armyworm, nutgrass armyworm, lawn armyworm, sugarcane leaf roller and black cutworm. (Chong). Adults of a PUNCTURE-VINE STEM WEEVIL (*Microlarinus lypriformis*) heavy in and on dead puncture-vine stems in Kamiloloa, Molokai. Many plants in area riddled with emergence holes and severely damaged. (Funasaki).

LIGHT TRAP COLLECTIONS

BL = blacklight
I = incandescent
MV = mercury vapor
O = other

	Temperature °F.	Precipitation (inches)	Type of trap	Agrotis ipsilon (black cutworm)	Carpocapsa pomonella (codling moth)	Chorizagrotis auxiliaris (army cutworm)	Estigmene acrea (salt-marsh caterpillar)	Faronta diffusa (wheat head armyworm)	Feltia subterranea (granulate cutworm)	Heliothis virescens (tobacco budworm)	H. zea (bollworm, corn earworm, tomato fruitworm)	Loxostege commixtalis (alfalfa webworm)	Loxostege similalis (garden webworm)	Loxostege sticticalis (beet webworm)	Manduca quinquemaculata (tomato hornworm)	Manduca sexta (tobacco hornworm)	Ostrinia nubilalis (European corn borer)	Peridroma saucia (variegated cutworm)	Prodenia ornithogalli (yellow-striped armyworm)	Pseudaletia unipuncta (armyworm)	Spodoptera exigua (beet armyworm)	Spodoptera frugiperda (fall armyworm)	Trichoplusia ni (cabbage looper)	Crops
FLORIDA																								
Gainesville 11/5, 7				2					3										1	4				
Gainesville 11/7-9				7					3									1	4	7		3		
GEORGIA																								
Tifton 11/3-9	25-75	0.01	BL								11													
SOUTH CAROLINA																								
Charleston 10/24-30	40-80	0.01	BL	10					9											14		6		
TEXAS																								
Brownsville 10/29-11/4	41-81	trace	2BL	80			1		48	1	6							24	3	20	79	1	43	
Brownsville 11/5-11	59-86	trace	2BL	105			7		126	6	10					1		34	8	194	19	12	62	
Waco 11/5-11			BL	6					74	1	2							104	4	1340	39	38		

SPRUCE BUDWORM SURVEY METHODS IN THE NORTHERN REGION

T. T. Terrell [1]

Detection Surveys - New outbreaks of spruce budworm, (*Choristoneura fumiferana* (Clem.)) are frequently discovered during aerial detection surveys.

Foliar damage caused by spruce budworm is most evident in the Northern Region during mid-August. Flights are made, however, from about August 1 through September 15. Before this period, light foliar damage has not turned red enough to be readily seen; after mid-September, fall storms decrease the evidence of feeding.

Flights are made over the timber type from 8 a.m. to about 2 p.m. Shadows are too long on northern and western slopes to permit earlier flights, and rough air terminates the afternoon flights.

Early morning light is best, however, for detecting infestations because it shows red better than noon-time light.

Flights are made at approximately 800 feet above the terrain. A contour pattern is flown in most of the Northern Region because the terrain does not lend itself to strip flights. We strive for practically 100-percent coverage of areas surveyed.

When evidence of spruce budworm damage is discovered, the outbreak areas are mapped on ½-inch to-the-mile maps.

Biological evaluation (Aerial) - Biological evaluations of spruce budworm include an aerial survey of known infestations. These are made in much the same manner as detection surveys. The damage is classified as to degree of intensity; light, moderate, or heavy. These classes cover fairly large areas of perhaps a small drainage or some topographical unit and are described by appearance as follows:

> Light - The damage ranges from barely visible to reddening of the upper one-fourth of the tree crown. Damage is not necessarily continuous throughout the stand. There may be a few heavier spots of damage.
>
> Moderate - Damage is clearly visible. The upper one-third to one-half of the crown is red. The damage is not necessarily continuous, and there may be some heavily damaged spots.
>
> Heavy - Damage is visible on most trees to the bottom of the crown. The damage is nearly continuous throughout the stand. There may be some top killing.

Subsequent ground examinations usually show that aerial observation classes fall into the following percentages of defoliation of current needle growth: Light 25 to 40, moderate 35 to 60, heavy 55 to 85.

Biological evaluation (Ground) - Samples of foliage are collected from the lower midcrown of intermediate trees to determine the number of budworm egg masses. Two samples each of sufficient quantity to cover a 4 by 4 foot canvas are collected from opposite sides of one-tree plots located in various parts of the area surveyed. They are taken in September or October after the eggs have hatched. The foliage is placed in large plastic bags and brought into the laboratory and stored in a cold room (about 38° F.). Twenty to 30 one-tree plots per area are desirable.

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[1] Forest Pest Control Branch, Northern Region, Forest Service, USDA

A crew of temporary employees is then hired to examine the foliage and remove all needles that have foreign material attached. This crew is supervised by an entomologist who measures the sample and estimates the percentage of current defoliation We have observed that women are more adept to this task because they seem to have more patience in performing routine, monotonous jobs.

The foliage is measured by spreading it loosely on a canvas covered table marked gridiron fashion from an end line to show the number of square inches of surface up to 2,000. The foliage is discarded.

The percent defoliation of current growth is estimated by examining 50 new growth shoots. Research note INT No. 86 on the following page will explain the procdure.

The complement of foliage remaining from previous years is also recorded because it has a bearing on the trees' chance of survival when current defoliation is severe.

The foliage is then passed to the examiners. The examiners remove and place all the needles, with foreign material attached, into pill boxes. These needles are then examined by the entomologist who removes the needles having budworm egg masses. He then separates the current year's egg masses from those of previous years. Old egg masses are discarded because they were found to be invalid as a measure of egg populations for the previous year in the Northern Region. Current egg masses are also examined to determine the percent parasitized by *Trichogramma* sp.

The graph below is used to predict the defoliation for the next season. It shows the correlation between egg masses and subsequent defoliation in the Northern Region, and it is quite accurate in 3 out of 4 years.

This estimate and all information regarding the past history of the outbreak are the bases of recommending for or against control projects.

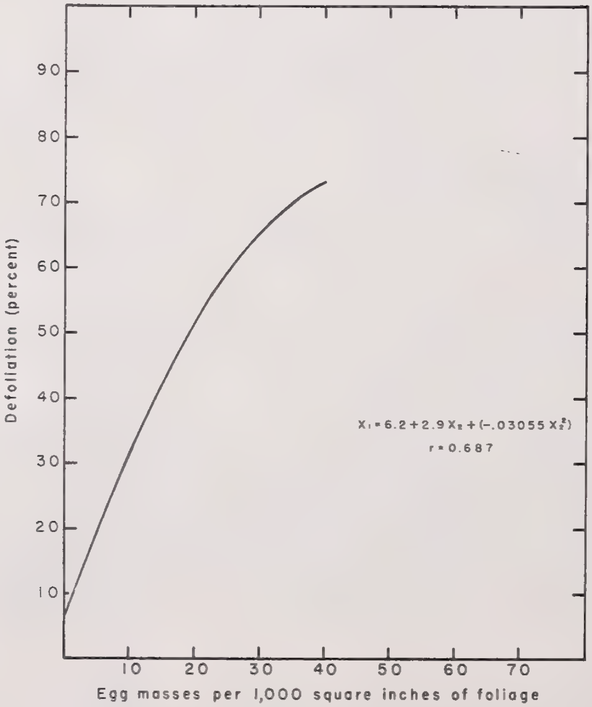

Figure 3.--Defoliation resulting from spruce budworm egg masses; 1959-1960, 1961-1962, and 1962-1963

ESTIMATING DEFOLIATION CAUSED BY SPRUCE BUDWORM FROM UNDAMAGED SHOOTS [1]

Tom T. Terell [2]

Spruce budworm (Choristoneura fumiferana (Clem.)) is a destructive pest in Douglas-fir forests, particularly in Montana, where more than 4 million acres of forest have been infested during the past decade. Surveys and control projects in infested areas have required thousands of man-days during the period of the outbreak. Much of this time is spent making operational surveys to delineate areas of infestation. Entomologists and foresters use various methods for measuring budworm activity, but estimates of defoliation caused by budworm larvae feeding on new-growth shoots is most commonly used. Damage to foliage is expressed in percent of foliage destroyed. All of the several methods for estimating defoliation require considerable field training.

In 1959 and 1960, while measuring defoliation on new-growth Douglas-fir shoots in Montana, an inverse relation was found between the percent of undamaged shoots and the percent of defoliation. This relation offers a simple method of estimating defoliation for survey personnel. Defoliation can be estimated by merely determining the percent of undamaged shoots which are easy to recognize and count.

The graph on the following page shows the relation between undamaged shoots and defoliation. The data are from 27 samples of foliage taken from permanent sample plots in Montana. The data were taken incidentally to an appraisal of defoliation and consist of notes taken by survey personnel. These notes clearly showed that the numbers of shoots with no defoliation were related inversely to the amount of defoliation for the sample. The degree of defoliation in the 27 samples ranged from light to very heavy and represented a good cross section of defoliation in Douglas-fir in Montana.

The data were analyzed by a multiple curvilinear regression treatment when the plotted data suggested a parabolic curve. T-tests of the coefficients show the data to be highly significant at the 99-percent level. The regression in the following figure was the basis for constructing the accompanying table, which converts the percent of undamaged shoots into percent of defoliation.

In practice, 50 shoots examined at midcrown give a good sample, but 100 shoots are better and give a count immediately convertible to percent.

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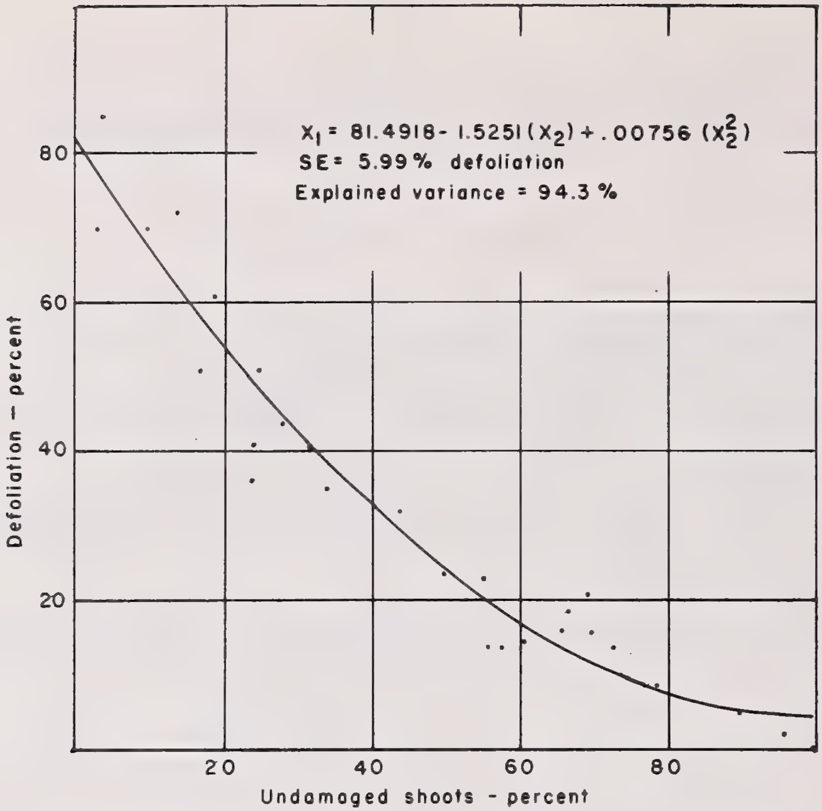
[1] Research Note, No. 86, USDA Forest Service, Intermountain Forest and Range Experiment Station, Ogden, Utah. October 1961.

[2] Division of Forest Insect Research.

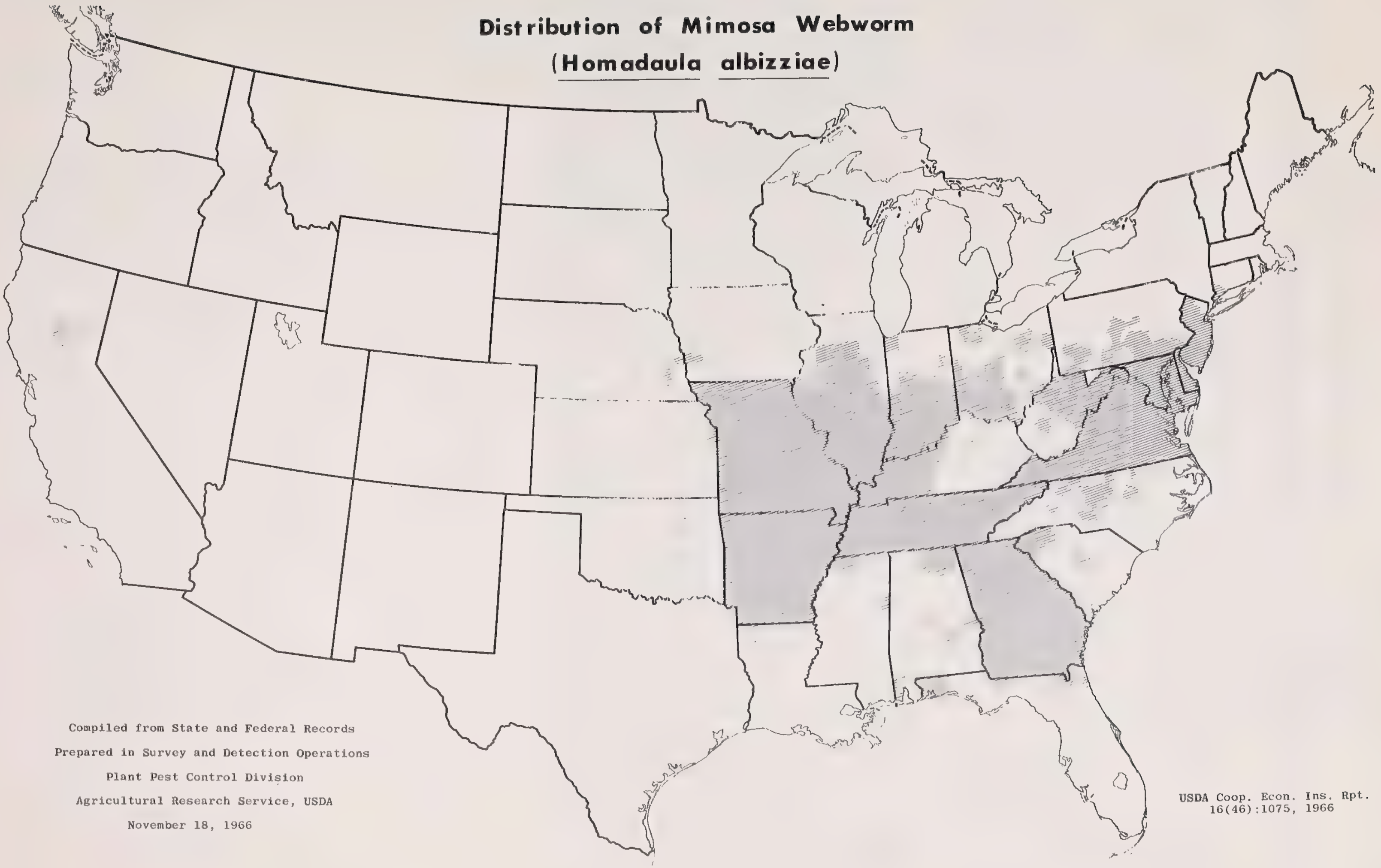


Relation between undamaged shoots and defoliation

Percent undamaged shoots	Percent defoliation (±6%)
0	81+
5	74
10	67
15	60
20	54
25	48
30	43
35	37
40	33
45	28
50	24
55	20
60	17
65	14
70	12
75	10
80	8
85	6
90	5
95	4.8
100	4.6

USDA Coop. Econ. Ins. Rpt.
16(46):1071-1074, 1966

Distribution of Mimosa Webworm
(*Homadaula albizziae*)



Compiled from State and Federal Records
Prepared in Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service, USDA
November 18, 1966

USDA Coop. Econ. Ins. Rpt.
16(46):1075, 1966

Weather continued from page 1062.

WEATHER OF THE WEEK ENDING NOVEMBER 14, 1966

HIGHLIGHTS: The coldest weather of the season moved into the north central United States while tropical air brought abundant precipitation to much of the East.

PRECIPITATION: The conflict between cold northerly winds and warm moist air from the Gulf of Mexico caused moderate showers, sleet, and some freezing rain from Arkansas to Michigan, while heavy thundershowers and a few tornadoes visited the Deep South. Scattered localities from eastern Texas to Georgia received 4 to 5 inches or more. Most of the middle and lower Mississippi, the Ohio and the Tennessee River Valleys received weekly totals exceeding 1 inch. Two-inch totals occurred across northern Indiana and northern Ohio. Rains occurred daily in the Pacific Northwest beginning Wednesday, and were still falling on Monday. Totals exceeded 2 inches along the coast. Snow fell above 2,500 feet in Washington, Oregon, and northern California, and above 5,000 feet in southern California, Arizona, and New Mexico. Flagstaff, Arizona, received 6 inches of wet snow on Tuesday. Snow also occurred along the eastern slope of the northern and central Rockies. Snow depths ranged up to 6 inches in western South Dakota and to 4 inches in western Nebraska.

TEMPERATURE: Last week's weather showed a strongly contrasting temperature pattern, with temperatures over the northern Great Plains averaging 10° to 20° below normal while temperatures over the Deep South were 8° to 12° above normal. The cold daily became more and more intense until Tuesday, when some stations registered minimums as much as 35° below the daily normals. Temperatures averaged near normal from the Pacific Ocean to the Continental Divide. Unseasonably mild weather prevailed over the Southeast and until Thursday in the Northeast, preceding a cooler weekend. Early in the week, a cold front brought subfreezing temperatures as far south as central Texas, the Boston Mountains in Arkansas, and the southern Appalachians. Arctic air crossed into the northern Great Plains later in the week with subzero temperatures over parts of 10 States. Some stations in North Dakota remained below freezing for the entire week. Brisk southerly winds brought unusual warmth to the eastern half of the Nation. In Kentucky, this warm week followed 9 consecutive cool weeks. The warm weather persisted throughout the week over the Southeast, but temperatures in the Northeast returned to near normal over the weekend. (Summary supplied by Environmental Data Service, ESSA).

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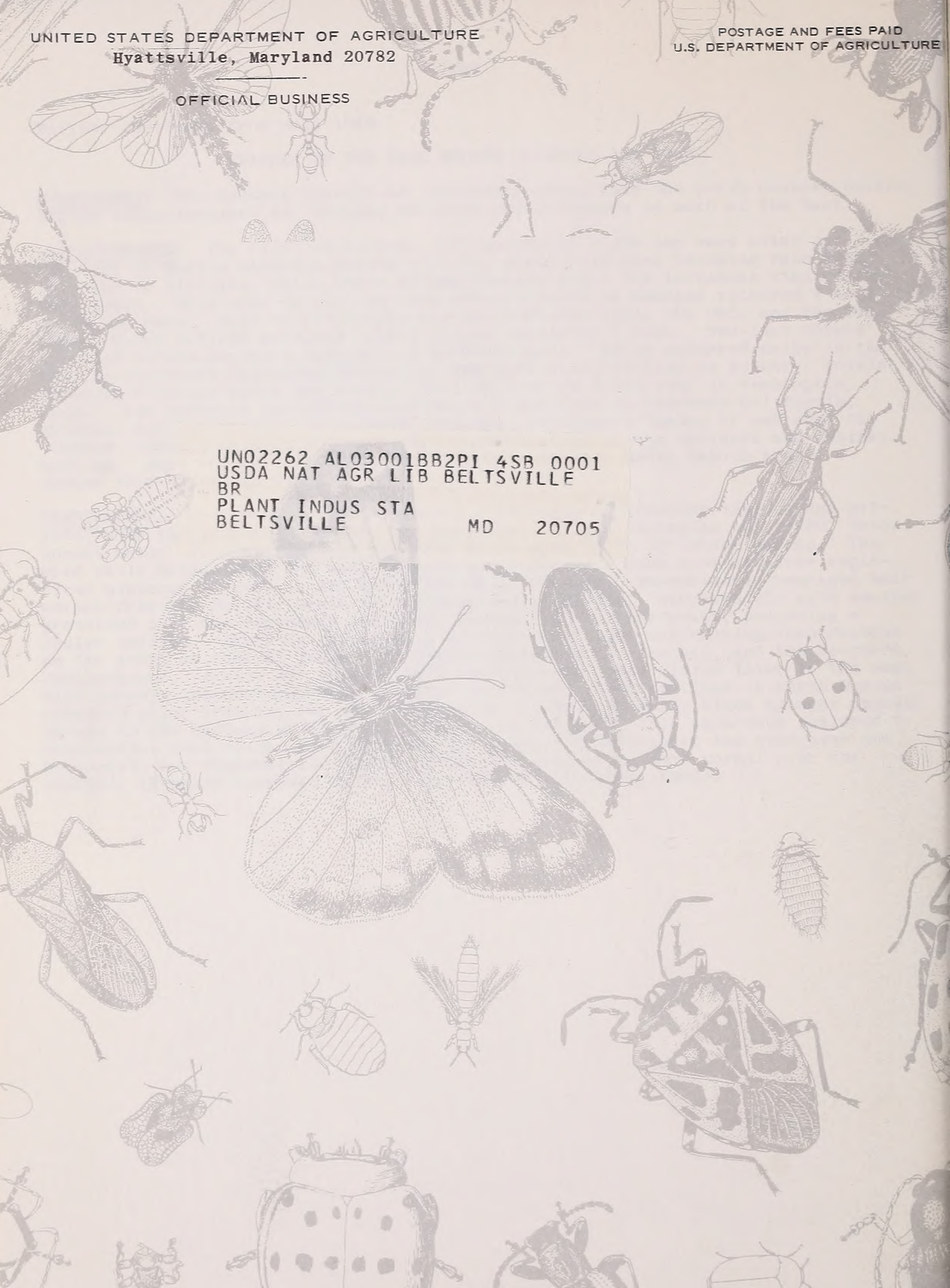

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